25X1

CLASSIFICATION

CENTRAL INTELLIGENCE AGENCY

REPORT

# INFORMATION REPORT

CD NO. 25X1

COUNTRY East Germany

DATE DISTR. 7 September 1955

SUBJECT Heinrich Hertz Institute Research Activities

NO. OF PAGES 9

25X1

PLACE ACQUIRED

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO.

SUPPLEMENT TO REPORT NO.

25X1



THIS IS UNEVALUATED INFORMATION

25X1

1. By early January 1955, the Heinrich Hertz Institute (H.H.I.) at Berlin-Adlershof had received 13 research orders which were subdivided into four groups: 25X1

Deputy Richard

Group I: This group concerns the measurement of the propagation of [redacted] waves [redacted] the direction of Dr. [redacted] Professor [redacted] Buchenhauer and [redacted] chief of Department II of the H.H.I. [redacted] order of this group concerns measurements in the propagation of waves between Adlershof and Neunfeichen, where comprehensive data of observation were obtained in 1954. These data are to be evaluated statistically in 1955. Moreover, in 1955, the reception of a 9-cm wave transmitter located at Neunfeichen is to be tested by a receiver located at Adlershof. The transmitter is equipped with a disc triode and has an output of only one watt. The second order included in this group concerns measurements in the propagation of waves in the 3 to 9-cm range, exceeding normal ranges. Moreover, the reception of West German radio stations operating on VHF from distances of 500 km and more is to be observed.

Group II: This group concerns itself with [redacted] research. Work assigned to this group will be supervised by [redacted] Dittmar (fnu). Orders received concern the measurement of wave length limits (Grenzwellenlaengen) and the damping of these waves. A transmitter continuously varying its frequencies for measurements to be made in the ionosphere is scheduled to be set up at Juliusruh on Ruegen Island.

Group III: Magnetic measurements. This research work is scheduled to be headed by Voilandt (fnu) at Neustrelitz.

Group IV: This group concerns research work on solar radiation. The group will work under Professor [redacted] chief of the H.H.I. The individual research missions assigned to this group were discussed in late 1954.

25X1

25X1

CLASSIFICATION

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STATE | X | NAVY | X | NSRB | | DISTRIBUTION | | | | | |
| ARMY | X | AIR | X | FBI | | | | | | | |

2. In late December 1954, the following information was obtained at the annual conference of the H.H.I. on the status of research work on solar radiation:

a. Except for individual missions, Department III of the H.H.I. will no longer participate in the radio-astronomic research work of the Institute.

b. In late August 1954, the following was decided at a conference between Herren Fuerstenberg, Schmidt and Farnik on the one side, and Dr. Jung on the other:

(1) Status of research work in late August 1954:
The 20-cm installation without switch has been dismantled for use with a second installation to be equipped with switch.
One 20-cm installation with switch was in operation; the installation showed fluctuations in its sensitivity. A second 20-cm installation was under construction. Completed were the oscillator, the noise generator, the mixer stage, the first and second intermediate frequency stages, the audio frequency amplifier, the switching stage, and the regulating stage. Under construction were the switch and the power supply unit with rack.
The 3-cm installation has been dismantled.

(2) Plans for the next phase of research work:
Regular observations of the effects of solar radiation were to be begun with the first completed 20-cm installation with switch. After completion of the second 20-cm installation, the first installation of this type was to be sent to Neustrelitz.
The second 20-cm installation with switch was to be tested by means of the large reflector, both with and without regulating stage.
The 3-cm installation was to be reassembled in its previous switching arrangement and was to serve as an operating model.

(3) Organization of work:
The 20-cm installations were assembled under the direction of Fuerstenberg. In charge of technical matters were Fuerstenberg, Prinzler and Bierhals.
The second installation was being built at the workshop of the H.H.I. The switching arrangement was supervised by Bierhals; responsible for the balancing was Prinzler, while Beier and Dr. Mollvow were charged with the construction and testing of switches. The completed installation was to be tested under the supervision of Fuerstenberg and Dr. Mollvow.
The 3-cm installation was to be reassembled under the supervision of Farnik. It was planned to modify the switches, the oscillator, the mixer [redacted] and the first intermediate frequency stage; all of these [redacted] arranged in a box near the reflector. Efforts had been initiated by [redacted] Lemke and the workshop of the Institute to procure non-corroding material for these units.
The construction of a second intermediate frequency stage with oscillator and mixer stage was completed by Herr Schmidt in late 1954. The audio frequency unit and the switching unit with time constant was completed in the workshop of the Institute in late 1954. Work on the switching and balancing units by Herr Bierhals and the construction of the d.c. amplifier and the wavemeter by Herr Schmidt were also completed by late 1954.
The mains unit for the klystron for which the drawings had been delivered by the radio engineering plant at Koepenick, were being built at the workshop of the Institute, while the electronically stabilized mains unit required for the other units of the installation was being built by the firm of Wachs and Klein [redacted] plans made by Herren Lemke and Schmidt.

25X1

25X1

SECRET [redacted]

25X1



3. Other plans made in August 1954 envisaged the following activities:

(1) Reconstruction of the gear unit for the reflector drive by [redacted] Luede.

(2) Removal of any slack from the gear box at the reflector by [redacted] Luede.

(3) Construction of an accurate adjusting scale for the coupling unit by [redacted] Luede and Fuerstenberg.

(4) Improvement of the follower stage by [redacted] Fuerstenberg.

(5) Unification in the set-up of the installation beginning with the first intermediate frequency stage. This problem was to be solved by a study group composed of representatives of Departments II, III and IV of the Institute.

(6) Development of testing procedures and the building of measuring devices for the whole installation.

(7) Work on the [redacted] of the most suitable detectors. The detectors previously [redacted] the Werk fuer Fernmeldewesen, were to be [redacted] by the Werk fuer Bauelemente der [redacted] former Dralowid Works. The manufacture and [redacted] of detectors for wave lengths of 1 cm and less is also to be considered.

(8) Absolute calibration; Dr. Mollwow worked on this problem. Of these plans, project item (4) was completed by late 1954; work on projects items (1) and (2) was still in progress, and projects items (3) and (5) through (8) were included in the 1955 work program of the solar radiation research group.

The construction of new sets designed for wave lengths of 10 and 50 cm was not envisaged. All those involved in solar radiation research work wanted to have a leader appointed who was authorized to [redacted] decisions in the event that the chief of the Institute was not available. The main function of this leader was to be the coordinating of all research work, the procurement of laboratory equipment, and the planning and control of the budget allocated for this project. 25X1

4. Solar observations.

Plans to send an expedition of the H.H.I. [redacted] in order to observe the solar eclipse were cancelled. An invitation to make these observations in Kiev reached the Institute too late. The expedition finally went to 25X1
Ruegen Island under the leadership of Professor Hachenberg, but it was [redacted] insufficiently prepared for its work. On 15 May 1954, [redacted] an astronomer [redacted] inspected the preparations for the expedition, but he left again rather disappointed. On 27 May, the equipment required for the solar measurements was sent to Ruegen Island. The observations were made from a point some km south of the ionosphere measuring station [redacted] Ing. Dittmar in the bay of Tromper Wiek, not far from Cape Arkona. 25X1
In early June, Professor Hachenberg supervised the arrival of [redacted] 20-cm station built at the H.H.I. The four-meter reflector arrived on [redacted]. The registrations made during the solar eclipse were hampered by poor visibility; moreover, the curves obtained showed irregularities owing to a failure of the electric clockwork. The installation was dismantled in late July and shipped to Neustrelitz. Only the [illegible]

SECRET [redacted]

25X1
25X1

station which was occupied by three or four men remained on Ruegen Island.

5. The first 3-cm installation was completed on time. The amplification factor and the band width had been determined by Herrn Farnick, Schmidt, and Handow at the Koepenick radio engineering plant, because the measuring installation required were not available at the H.H.I. The intermediate frequency amplifier developed by Herr Schmidt showed some defects which could not be eliminated. The mains frequency for the rotating mechanism furnished by the firm of Zeiss was not constant enough and batteries were employed instead. The 3-cm installation was ready for operation at Adlershof one day before the solar eclipse. It worked without any failure. The reflector could be set optically. The electric control device also worked satisfactorily in spite of great initial difficulties. The remote-controlled gear had to have an accuracy of alignment of up to 0.6°. The curves registered were faultless. The second 20-cm installation which was completed in a makeshift way was also used in connection with the large reflector at Adlershof. The curves obtained with the help of the 20-cm and 3-cm installations agreed with each other rather well. On 6 July, Professor Hachenberg stated that he was well satisfied with the results obtained at Adlershof.

6. In early October 1954, a five-stage intermediate frequency amplifier for 60 megacycles per second developed by Herr Schmidt was put into use. The equipment had a band width of 55.5 to 61.5 megacycles per second, and brought about a magnification from 1 millivolt input to 1.4 Volt output with a noise voltage of less than 0.5 Volt.

7. In early June 1954, a wooden observation tower resting on a concrete base was erected between Altenkirchen and Juliusruh for the H.H.I. Chief of the station was Dr. Dittmar. By his order, the electric light was cut off at Juliusruh, Breege, and Altenkirchen on the day of the solar eclipse in order to make his measurements independent of fluctuations in the electric mains. The station remained occupied after the solar eclipse. 25X1

8. The Meteorologisch-Hydrologischer Dienst (Meteorological and Hydrological Service)(MHD) sent an expedition of 22 men [redacted] for the observation of the solar eclipse. The expedition was equipped with modern apparatus built by the Zeiss firm but was unable to make any photographs because the sky was completely overcast during the eclipse. [redacted] 25X1 [redacted]. An investigation was subsequently started against those who were responsible for the expedition [redacted] inasmuch as the USSR had invited the MHD to send an expedition to the USSR. 25X1

9. In order to study the propagation of VHF waves in the troposphere, a testing line about 70 km long was established between Adlershof and Fuenfeichen. The transmitter which had an output of 50 watts was set up in the area of the Institute at Adlershof. The directional antenna fitted with three rows of dipoles designed for the frequencies of 40 megacycles per second, 62 or 68 megacycles per second, and 104 megacycles per second respectively was on the roof of the former long-distance heating plant of the former German Aeronautical Test Institute. Each row of dipoles consisted of four vertical dipoles each consisting of one reflector and one director. The beam width was about 30°, and the antenna gain was fourfold. The dipoles were fed in a parallel way via a 70-ohm cable and matching pots. The Rauscher Berge (a chain of hills) located on the testing line did not have any disturbing 25X1

effect. No relay station was erected on the Mueggelberge Hills as originally planned, because the connection between Adlershof and Fuenfeichen proved to be good. Prof Lange was in charge of the measurements concerned with the propagation of radio waves. Prior to October 1954, no results of the observations made had been published.

10. In October 1954, the construction of modern housing units was planned for the branch installations of the H.H.I.L. at Juliusruh on Ruegen Island, Neustrelitz, Kuehlungsborn, and Fuenfeichen.

11. In 1954, Dr. Praxmarer experimented with two magnetron tubes designed for wave length of [redacted] and 3 cm at the Department for Super High Frequency Techniques. The greatest difficulties were experienced in the field of cathodes. Between August and November 1954, 20 different cathodes were tested. At first the standard paste for radio tubes was used, later a special paste made at the Institute was applied. The work was delayed, because the high-frequency generator of the Institute was not completed. The cathodes had therefore to be taken to the Werk fuer Fernmeldewesen. (Signal Communication Engineering Plant).
The 3-cm tube was to be used as a model for the investigation of the mechanical arrangement, especially of the cathode. In early November, when the tube was given an impulse of 7 KW, it was made to oscillate for the first time and had a life time of two days. Another such tube was in operation for several days in November. It was made to oscillate even when its vacuum was rather poor. The cathode paste developed proved usable. Impulse effects of 80 KW and, with an improved cathode, even such of 400 KW were reached in accordance with values calculated theoretically. The tests showed that the diameter of the cathode was a critical factor for the build-up period (starting of the oscillating process). Thereupon the diameter of the 1.25 cm magnetrons was reduced from 6 to 5 mm. After that reduction the tube could be made to oscillate.

12. Dr. Praxmarer stated that he had succeeded, while he was in the USSR, in [redacted] tron tubes designed for a wave length of 1.25 cm. He admitted, however, that conditions for experimenting had been much more favorable there than in the GDR.[2] The first samples of the 1.25 cm tubes suffered from flash-overs between anode and cathode, probably due to a defective vacuum and inadequate mechanical arrangement of the cathode. The assembly of one tube lasted one day. In late November, the flash-overs were eliminated for the first time, and in early December, the tube was repeatedly made to oscillate for a short time. Subsequently, the tube was subjected to a continuous test extending over three days. The tube was switched off for a short while, after that it was again brought to oscillation. At the end of the experiment, the output of the tube decreased, because scattering effects occurred in the cathode. The tube was then disassembled and checked. Its output was estimatedby means of a water calorimeter.
In order to improve the high vacuum and make possible an easy exchange of the cathodes, soldering was abandoned for sealing purposes in December 1954, and a cylinder fitted with two conical slides was used instead. A satisfactory vacuum was not achieved, however and for mass production the set up of the cathode was not stable enough. In spite of this fact, it appears that the right way had been chosen.

13. Prof Praxmarer cannot possibly have worked on crystal prob[redacted] 1954, because he was entirely absorbed in the development of the [redacted] magnetron. On the other hand, Prof Flietner, who was coached by [redacted] or Hachenberg, was working on a paper related to problems of semiconductors. 25X1

25X1

SECRET

25X1



Since August 1954, Flietner had been assisted by [redacted] (fnu), a student from Potsdam. Both of them have been ordered to [redacted] germanium monocrystals.

14. Prior to late 1954, Dr. Jung developed a set designed to measure the thickness and depth of salt layers. Since early 1955, Dr. Jung has worked on the development of a set designed to determine the location of iron particles swallowed by animals.
In October 1954, Dipl. Ing. Kaszinski continued the research work begun by Schuenemann in the field [redacted] ray generators. Although Kaszinski is believed to be a capable [redacted] he does not have original ideas; and so, no outstanding results are to be expected from his work.

15. In 1954, staff workers at the H.H.I. [redacted] in opposition to Professor Hachenberg, the chief of the Institute [redacted] included Dr. Praxmarer, Dr. Jung, Dr. Reinhardt, and chief engineer Falk. The spokesman of the group was Dr. Praxmarer. The opposition believes that Hachenberg is only a second-rate scientist and does not have the qualifications required for a chief of the Institute. The members of this group [redacted] enberg for having prepared the expedition for the observation of the solar eclipse [redacted] in an inadequate way. The 25X1
opposition [redacted] ists of technical physicists [redacted] are mainly interested in prob[redacted]ogy, while Hachenberg comes from [redacted] University and is mainly [redacted] theoretical problems, above all in problems of solar astronomy and semiconductors. Hachenberg's plans did not fit in with the missions assigned to the H.H.I. In view of these plans, he did not show much interest in the work done by Dr. Reinhardt and Dr. Praxmarer. On the other hand, he relied heavily on Dr. Jung who assisted him in the development of receivers required for the registration of solar rays in the wave ranges of 1.25, 3, 10, 20, 50 and 200 cm.

16. On 13 September 1954, three Hungarian professors accompanied by Dr. Ottorn from the Deutsche Akademie der Wissenschaften (German Academy of Sciences) and Hungarian interpreter visited the H.H.I. Dr. Jung and Prof. Schuenemann showed the guests, who were probably university professors [redacted] Institute] for five hours. The Hungarians were greatly interested in [redacted] research. They subsequently visited the Optical Institute and the Institute of Crystal Physics. On 3 September, three professors of physics of Prague [redacted] visited the Institute. They wanted to discuss problems of [redacted] 25X1
and semiconductors with Professor Hachenberg, who was absent. [redacted] following day, the Czechoslovaks were shown the Institute by [redacted] Ballwow.

17. Dr. Hachenberg, Dr. Jung, Dr. Rabenhorst and Dr. Reinhardt attended the conference of physicists [redacted] During this conference, Professor Schuetz of Jena University offered a previous assistant of his [redacted] a professorship in Jena. The physicist [redacted] conference on problems related to semiconductors [redacted] was [redacted] by Prof. [redacted]is, who is subordinate to Dr. Eckardt of the Institute for Research on Solid Bodies in Buch. On 15 December 1954, Dr. Hueter, [redacted] was unexpectedly given notice of discharge effective 1 January 1955. This procedure was resented by all members of 25X1
the Inst[redacted] including Professor Hachenberg, who stated that he had not been i[redacted] of Hueter's intended dismissal. In Nov[redacted] 25X1
graduate physicist, was transferred from the German [redacted] to the H.H.I. for work in Dr. Jung's department. God[redacted] able physicist and has done research work on Goley [redacted] member and is said to have been sent [redacted] the Institute [redacted] Central Committee. Professor Hachenberg protested [redacted] which Gode was transferred to the Institute without [redacted] approval.

25X1

SECRET

25X1

25X1

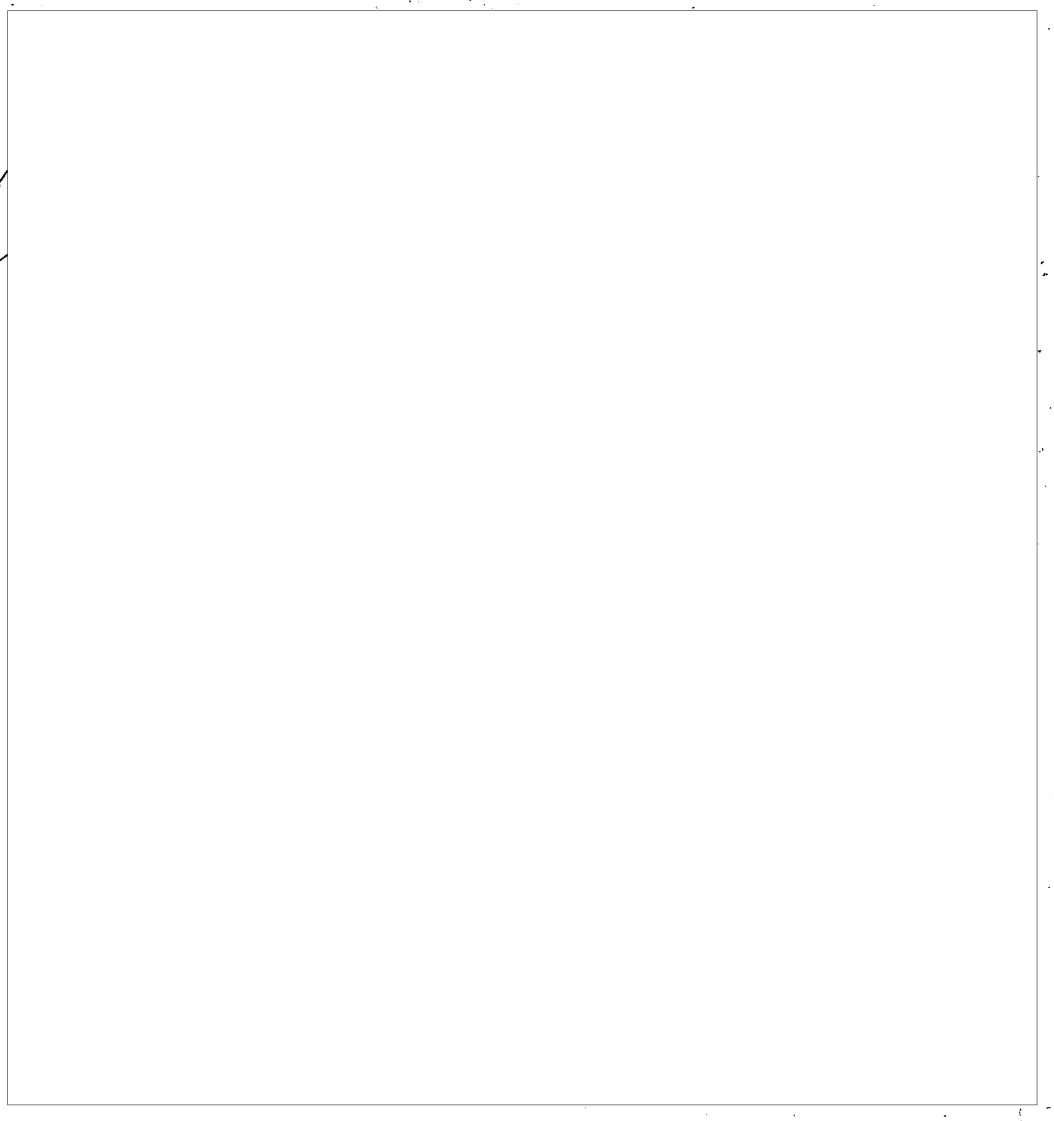
SECRET

25X1



1. Comment. For copy of a photograph of the directional antenna as published in an East German newspaper in October 1954, see Annex 1. 25X1

25X1



25X1

SECRET

25X1

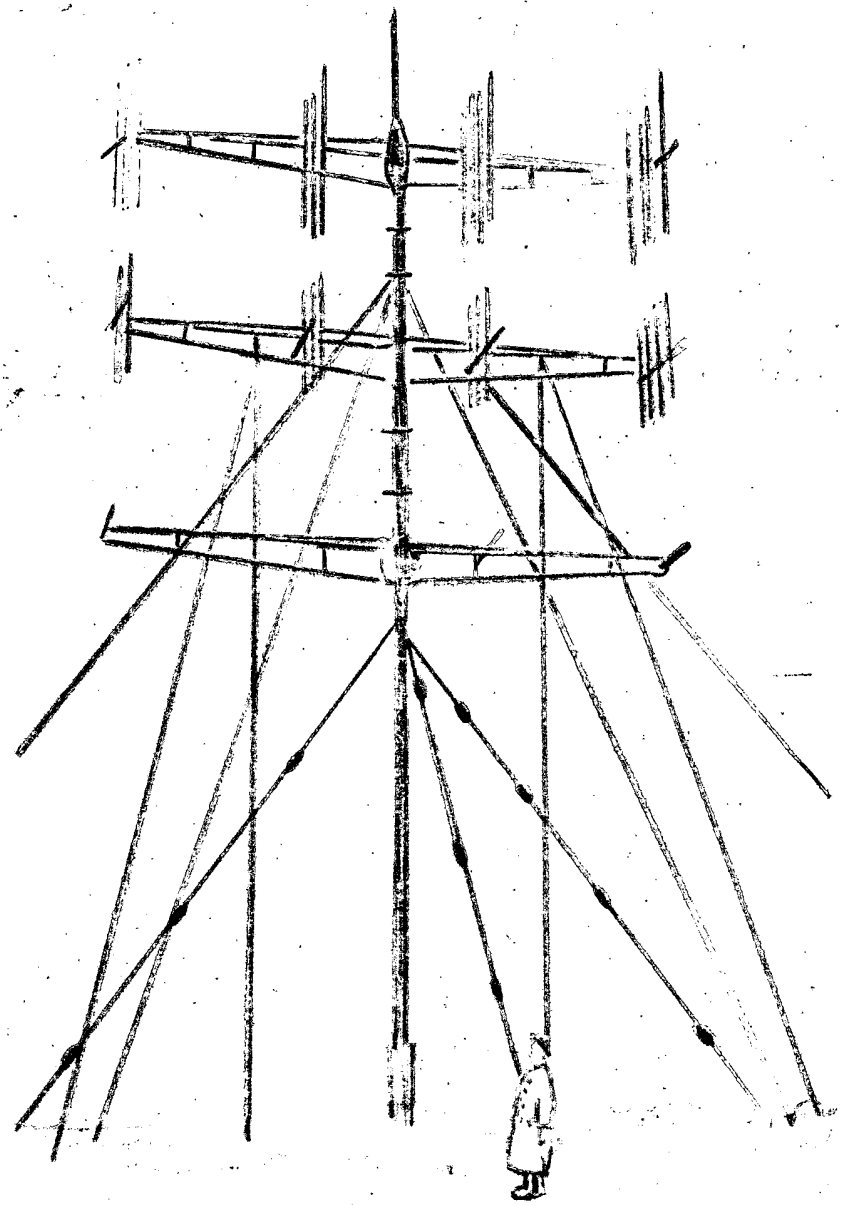
25X1

S-E-C-R-E-T

[redacted]



Annex 1 X 1.



Directional Antenna for the Ultra Short Wave Experimental Circuit at Adlershof

25X1

Directional Antenna for the

S-E-C-R-E-T

[redacted]

Ultra Short Wave Experimental Circuit at Adlershof

CENTRAL INTELLIGENCE AGENCY

# INFORMATION REPORT

REPORT

CD NO. 25X1

COUNTRY East Germany

DATE DISTR. 7 September 1955

SUBJECT Heinrich Hertz Institute Research Activities

NO. OF PAGES 9

25X1

PLACE ACQUIRED

NO. OF ENCLS. (LISTED BELOW)

DATE OF INFO.

SUPPLEMENT TO REPORT NO. 25X1



THIS IS UNEVALUATED INFORMATION

25X1

1. By early January 1955 the Heinrich Hertz Institute (H.H.I.) at Berlin-Adlershof had received 13 research orders which were subdivided into four groups.

Group I: This group concerns the measurement of the propagation of VHF waves under the direction of Dr. Schuenemann, the deputy to Professor Richard Schachenmaier and the real chief of Department II of the H.H.I. The first order of this group concerns measurements in the propagation of waves between Adlershof and Fuenfeichen, where comprehensive data of observation were obtained in 1954. These data are to be evaluated statistically in 1955. Moreover, in 1955, the reception of a 9-cm wave transmitter located at Fuenfeichen is to be tested by a receiver located at Adlershof. The transmitter is equipped with a disc triode and has an output of only one watt. The second order included in this group concerns measurements in the propagation of waves in the 3 to 9-cm range, exceeding normal ranges. Moreover, the reception of West German radio stations operating on VHF from distances of 500 km and more is to be observed.

Group II: This group concerns itself with ionospheric research. Work assigned to this group will be supervised by one Dittmar (fnu). Orders received concern the measurement of wave length limits (Grenzwellenlaengen) and the damping of these waves. A transmitter continuously varying its frequencies for measurements to be made in the ionosphere is scheduled to be set up at Juliusruh on Ruegen Island.

Group III: Magnetic measurements. This research work is scheduled to be headed by Vollandt (fnu) at Neustrelitz.

Group IV: This group concerns research work on solar radiation. The group will work under Professor Otto Hachenberg, chief of the H.H.I. The individual research missions assigned to this group were discussed in late 1954.

25X1

S-E-C-R-E-T

CLASSIFICATION

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STATE | X | NAVY | X | NSRB | | DISTRIBUTION | | | | | | |
| ARMY | X | AIR | X | FBI | | | | | | | | |

25X1

2. In late December 1954, the following information was obtained at the annual conference of the H.H.I. on the status of research work on solar radiation:

a. Except for individual missions, Department III of the H.H.I. will no longer participate in the radio astronomic research work of the Institute.

b. In late August 1954, the following was decided at a conference between Fuerstenberg, Schmidt and Farnik on the one side, and Dr. Jung on the other:

(1) Status of research work in late August 1954:
The 20-cm installation without a switch has been dismantled for use with a second installation to be equipped with a switch.
One 20-cm installation with switch was in operation; the installation showed fluctuations in its sensitivity. A second 20-cm installation was under construction. Completed were the oscillator, the noise generator, the mixer stage, the first and second intermediate frequency stages, the audio frequency amplifier, the switching stage, and the regulating stage. Under construction were the switch and the power supply unit with rack.
The 3-cm installation has been dismantled.

(2) Plans for the next phase of research work:
Regular observations of the effects of solar radiation were to be begun with the first completed 20-cm installation with switch. After completion of the second 20-cm installation, the first installation of this type was to be sent to Neustrelitz.
The second 20-cm installation with switch was to be tested by means of the large reflector, both with and without regulating stage.
The 3-cm installation was to be reassembled in its previous switching arrangement and was to serve as an operating model.

(3) Organization of work:
The 20-cm installations were assembled under the direction of Fuerstenberg. In charge of technical matters were Fuerstenberg, Prinzler and Bierhals.
The second installation was being built at the workshop of the H.H.I. The switching arrangement was supervised by Bierhals; responsible for the balancing was Prinzler, while Beier and Dr. Mollvow were charged with the construction and testing of switches. The completed installation was to be tested under the supervision of Fuerstenberg and Dr. Mollvow.
The 3-cm installation was to be reassembled under the supervision of Farnik. It was planned to modify the switches, the oscillator, the mixer stage and the first intermediate frequency stage; all of these units were arranged in a box near the reflector. Efforts had been initiated by Luede and the workshop of the Institute to procure non-corroding material for these units.
The construction of a second intermediate frequency stage with oscillator and mixer stage was completed by Schmidt in late 1954. The audio frequency unit and the switching unit with time constant was completed in the workshop of the Institute in late 1954. Work on the switching and balancing units by Bierhals and the construction of the d.c. amplifier and the wavemeter by Schmidt were also completed by late 1954.
The mains unit for the klystron for which the drawings had been delivered by the radio engineering plant at Koepenick, were being built at the workshop of the Institute, while the electronically stabilized mains unit required for the other units of the installation was being built by the firm of Wachs and Klein according to plans made by Luede and Schmidt.

25X1

3. Other plans made in August 1954 envisaged the following activities:

(1) Reconstruction of the gear unit for the reflector drive by Luede.

(2) Removal of any slack from the gear box at the reflector by Luede.

(3) Construction of an accurate adjusting scale for the coupling unit by Luede and Fuerstenberg.

(4) Improvement of the follower stage by Fuerstenberg.

(5) Unification in the set-up of the installation beginning with the first intermediate frequency stage. This problem was to be solved by a study group composed of representatives of Departments II, III and IV of the Institute.

(6) Development of testing procedures and the building of measuring devices for the whole installation.

(7) Work on the problem of the most suitable detectors. The detectors previously used, which had been built by the Werk fuer Fernmeldewesen, were to be replaced by detectors developed by the Werk fuer Bauelemente der Nachrichtentechnik, the former Dralowid Works. The manufacture and gauging of detectors for wave lengths of 1 cm and less is also to be considered.

(8) Absolute calibration; Dr. Mollwow worked on this problem. Of these plans, project item (4) was completed by late 1954; work on projects items (1) and (2) was still in progress, and projects items (3) and (5) through (8) were included in the 1955 work program of the solar radiation research group.

The construction of new sets designed for wave lengths of 30 and 50 cm was not envisaged. All those involved in solar radiation research work wanted to have a leader appointed who was authorized to make decisions in the event that the chief of the Institute was not available. The main function of this leader was to be the coordinating of all research work, the procurement of laboratory equipment, and the planning and control of the budget allocated for this project. 25X1

4. Solar observations.

Plans to send an expedition of the H.H.I. [redacted] in order to observe the solar eclipse were cancelled. An invitation to make these observations in Kiev reached the Institute too late. The expedition finally went to 25X1
Ruegen Island under the leadership of Professor Hachenberg, but it was insufficiently prepared for its work. On 15 May 1954, [redacted] an astronomer [redacted] inspected the preparations for the expedition, but he left again rather disappointed. On 27 May, the equipment required for the solar measurements was sent to Ruegen Island. The observations were made from a point some km south of the ionosphere measuring station selected by Ing. Dittmar in the bay of Tromper Wiek, not far from Cape Arkona, in early June 1954. A mast 30 meters high had been erected 25X1
there. In early June, Professor Hachenberg supervised the arrival of the first 20-cm station built at the H.H.I. The four-meter reflector arrived on 16 June. The registrations made during the solar eclipse were hampered by poor visibility; moreover, the curves obtained showed irregularities owing to a failure of the electric clockwork. The installation was dismantled in late July and shipped to Neustrelitz. Only the ionosphere



25X1

station which was occupied by three or four men remained on Ruegen Island.

5. The first 3-cm installation was completed on time. The amplification factor and the band width had been determined by Farnick, Schmidt, and Handow at the Koepenick radio engineering plant, because the measuring installation required were not available at the H.H.I. The intermediate frequency amplifier developed by Schmidt showed some defects which could not be eliminated. The mains frequency for the rotating mechanism furnished by the firm of Zeiss was not constant enough and batteries were employed instead. The 3-cm installation was ready for operation at Adlershof one day before the solar eclipse. It worked without any failure. The reflector could be set optically. The electric control device also worked satisfactorily in spite of great initial difficulties. The remote-controlled gear had to have an accuracy of alignment of up to 0.6°. The curves registered were faultless. The second 20-cm installation which was completed in a makeshift way was also used in connection with the large reflector at Adlershof. The curves obtained with the help of the 20-cm and 3-cm installations agreed with each other rather well. On 6 July, Professor Hachenberg stated that he was well satisfied with the results obtained at Adlershof.

6. In early October 1954, a five-stage intermediate frequency amplifier for 60 megacycles per second developed by Schmidt was put into use. The equipment had a band width of 55.5 to 61.5 megacycles per second, and brought about a magnification from 1 millivolt input to 1.4 Volt output with a noise voltage of less than 0.5 Volt.

7. In early June 1954, a wooden observation tower resting on a concrete base was erected between Altenkirchen and Juliusruh for the H.H.I. Chief of the station was Dr. Dittmar. By his order, the electric light was cut off at Juliusruh, Breege, and Altenkirchen on the day of the solar eclipse in order to make his measurements independent of fluctuations in the electric mains. The station remained occupied after the solar eclipse.

25X1

8. The Meteorologisch-Hydrologischer Dienst (Meteorological and Hydrological Service)(MHD) sent an expedition of 22 men [redacted] for the observation of the solar eclipse. The expedition was equipped with modern apparatus built by the Zeiss firm but was unable to make any photographs because the sky was completely overcast during the eclipse. [redacted] An investigation was subsequently started against those who were responsible for the expedition [redacted] inasmuch as the USSR had invited the MHD to send an expedition to the USSR.

25X1

25X1

9. In order to study the propagation of VHF waves in the troposphere, a testing line about 70 km long was established between Adlershof and Fuenfeichen. The transmitter which had an output of 50 watts was set up in the area of the Institute at Adlershof. The directional antenna fitted with three rows of dipoles designed for the frequencies of 40 megacycles per second, 62 or 68 megacycles per second, and 104 megacycles per second respectively was on the roof of the former long-distance heating plant of the former German Aeronautical Test Institute.[1] Each row of dipoles consisted of four vertical dipoles each consisting of one reflector and one director. The beam width was about 30°, and the antenna gain was fourfold. The dipoles were fed in a parallel way via a 70-ohm cable and matching pots. The Rauesche Berge (a chain of hills) located on the testing line did not have any disturbing

25X1

effect. No relay station was erected on the Mueggelberge Hills as originally planned, because the connection between Adlershof and Fuenfeichen proved to be good. Lange was in charge of the measurements concerned with the propagation of radio waves. Prior to October 1954, no results of the observations made had been published.

10. In October 1954, the construction of modern housing units was planned for the branch installations of the H.H.I. at Juliusruh on Ruegen Island, Neustrelitz, Kuehlungsborn, and Fuenfeichen.

11. In 1954, Dr. Praxmarer experimented with two magnetron tubes designed for wave length of 1.25 cm and 3 cm at the Department for Super High Frequency Techniques. The greatest difficulties were experienced in the field of cathodes. Between August and November 1954, 20 different cathodes were tested. At first the standard paste for radio tubes was used, later a special paste made at the Institute was applied. The work was delayed, because the high-frequency generator of the Institute was not completed. The cathodes had therefore to be taken to the Werk fuer Fernmeldewesen. (Signal Communication Engineering Plant).
The 3-cm tube was to be used as a model for the investigation of the mechanical arrangement, especially of the cathode. In early November, when the tube was given an impulse of 7 KW, it was made to oscillate for the first time and had a life time of two days. Another such tube was in operation for several days in November. It was made to oscillate even when its vacuum was rather poor. The cathode paste developed proved usable. Impulse effects of 80 KW and, with an improved cathode, even such of 400 KW were reached in accordance with values calculated theoretically. The tests showed that the diameter of the cathode was a critical factor for the build-up period (starting of the oscillating process). Thereupon the diameter of the 1.25 cm magnetrons was reduced from 6 to 5 mm. After that reduction the tube could be made to oscillate.

12. Dr. Praxmarer stated that he had succeded, while he was in the USSR, in causing the oscillation of magnetron tubes designed for a wave length of 1.25 cm. He admitted, however, that conditions for experimenting had been much more favorable there than in the GDR.[2] The first samples of the 1.25 cm tubes suffered from flash-overs between anode and cathode, probably due to a defective vacuum and inadequate mechanical arrangement of the cathode. The assembly of one tube lasted one day. In late November, the flash-overs were eliminated for the first time, and in early December, the tube was repeatedly made to oscillate for a short time. Subsequently, the tube was subjected to a continuous test extending over three days. The tube was switched off for a short while, after that it was again brought to oscillation. At the end of the experiment, the output of the tube decreased, because scattering effects occurred in the cathode. The tube was then disassembled and checked. Its output was estimated by means of a water calorimeter.
In order to improve the high vacuum and make possible an easy exchange of the cathodes, soldering was abandoned for sealing purposes in December 1954, and a cylinder fitted with two conical slides was used instead. A satisfactory vacuum was not achieved, however and for mass production the set up of the cathode was not stable enough. In spite of this fact, it appears that the right way had been chosen.

13. Praxmarer cannot possibly have worked on crystal problems in 1954, because he was entirely absorbed in the development of the 1.25 cm magnetron. On the other hand, Flietner, who was coached by Professor Hachenberg, was working on a paper related to problems of semiconductors.

Since August 1954, Flietner has been assisted by Insert (fnu), a student from Potsdam. Both of them have been ordered to grow germanium monocrystals.

14. Prior to late 1954, Dr. Jung developed a set designed to measure the thickness and depth of salt layers. Since early 1955, Dr. Jung has worked on the development of a set designed to determine the location of iron particles swallowed by animals.
In October 1954, Dipl. Ing. Kaszinski continued the research work begun by Schuenemann in the field of sound ray generators. Although Kaszinski is believed to be a capable man, he does not have original ideas; no outstanding results are to be expected from his work.

15. In 1954, staff workers at the H.H.I. who were in opposition to Professor Hachenberg, the chief of the Institute, included Dr. Praxmarer, Dr. Jung, Dr. Reinhardt, and chief engineer Feik. The spokesman of the group was Dr. Praxmarer. The opposition believes that Hachenberg is only a second-rate scientist and does not have the qualifications required for a chief of the Institute. The members of this group also blamed Hachenberg for having prepared the expedition for the observation of the solar eclipse [redacted] in an inadequate way. The opposition consists of technical physicists, who are mainly interested in problems of technology, while Hachenberg comes from a university and is mainly interested in theoretical problems, above all in problems of solar astronomy and semiconductors. Hachenberg's plans did not fit in with the missions assigned to the H.H.I. In view of these plans, he did not show much interest in the work done by Dr. Reinhardt and Dr. Praxmarer. On the other hand, he relied heavily on Dr. Jung who assisted him in the development of receivers required for the registration of solar rays in the wave ranges of 2.25, 3, 10, 20, 50 and 200 cm. 25X1

16. On 13 September 1954, three Hungarian professors accompanied by Dr. Otterm from the Deutsche Akademie der Wissenschaften (German Academy of Sciences) and a Hungarian interpreter visited the H.H.I. Dr. Jung and Schuenemann showed the guests, who were probably university professors, around the Institute for five hours. The Hungarians were greatly interested in solar research. They subsequently visited the Optical Institute and the Institute of Crystal Physics. On 3 September, three professors of physics of Prague University visited the Institute. They wanted to discuss problems of solar research and semiconductors with Professor Hachenberg, who was absent. On the following day, the Czechoslovaks were shown the Institute by Mollve... 25X1

17. Dr. Hachenberg, Dr. Jung, Dr. Habenhorst and Dr. Reinhardt attended the conference of physicists [redacted] During this conference, Professor Schuetz of Jena University offered a previous assistant of his [redacted] a professorship in Jena. The physicist flatly refused the offer. The conference on problems related to semiconductors [redacted] was attended by Wallis, who is subordinate to Dr. Eckardt of the Institute for Research on Solid Bodies in Buch. On 15 December 1954, Dr. Hueter, [redacted] was unexpectedly given notice of discharge effective 1 January 1955. This procedure was resented by all members of the Institute, including Professor Hachenberg, who stated that he had not been informed of Hueter's intended dismissal. In November 1954, Gode, a graduate physicist, was transferred from the German Academy of Sciences to the H.H.I. for work in Dr. Jung's department. Gode is reputed to be an able physicist and has done research work on Golay cells. He is an SED member and is said to have been sent to the Institute by order of the SED Central Committee. Professor Hachenberg protested in vain against the way in which Gode was transferred to the Institute without his approval. 25X1 25X1 25X1

1. Comment. For copy of a photograph of the directional antenna as published in an East German newspaper in October 1954, see Annex 1. 25X1

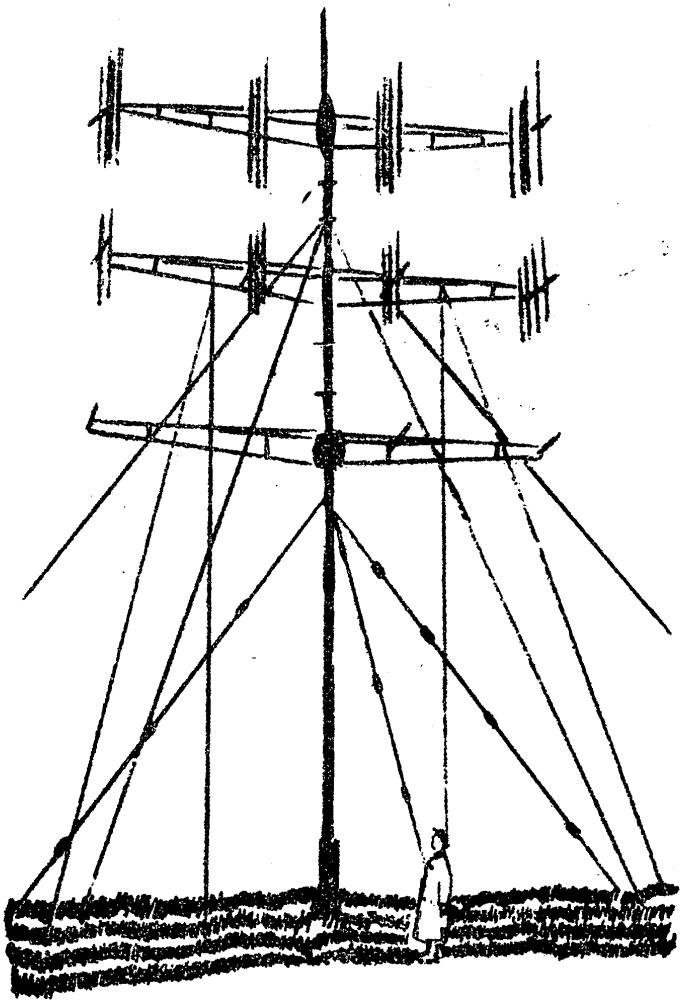
2. 25X1

25X1

25X1



Annex 1



Directional Antenna for the Ultra Short Wave Experimental Circuit at Adlershof



25X1